PATENT ABSTRACTS OF JAPAN

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(71)Applicant : **SEIKO EPSON CORP**

(72)Inventor : **IGARASHI HITOSHI**
YOSHIDA MASANORI

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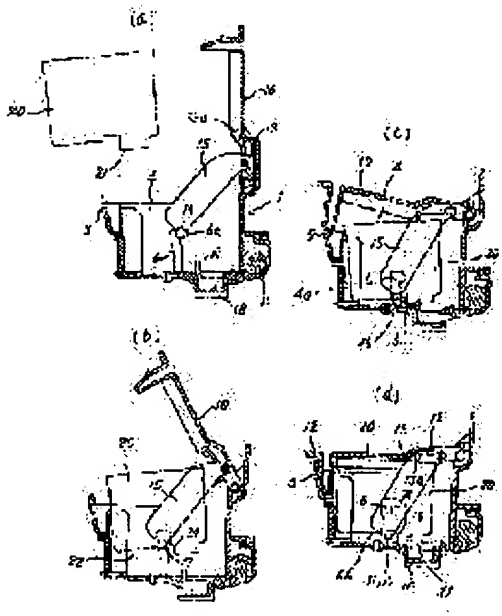
(54) INK CARTRIDGE AND LOADING MECHANISM THEREOF



(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ink cartridge, which can be correctly loaded to a cartridge loading member, and its loading mechanism.

SOLUTION: By closing a lid body 10 under the condition that a lifter 15 is guided by a guide groove 6 parallel to the axis center of an ink feeding needle after a supporting rod 17 is engaged with a recessed part 24 provided on the under surface of an ink cartrid cartridge 20, the ink cartridge 20 is lowered precisely towards a recording head 18 so as to precisely install the ink feeding needle 19 without being damaged.

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CLAIMS

[Claim(s)]

[Claim 1] The ink cartridge characterized by putting side by side the crevice combined with a part of lifter member with an ink feed hopper on the inferior surface of tongue of an ink cartridge body.

[Claim 2] The ink cartridge according to claim 1 characterized by forming the above-mentioned crevice in the die length which reaches the both-sides side of the above-mentioned ink cartridge body.

[Claim 3] The ink cartridge according to claim 1 characterized by forming the above-mentioned crevice so that it may project inside an ink cartridge body.

[Claim 4] While establishing the interior of a proposal which extends in the sense parallel to the axial center of the above-mentioned ink supply needle in the inside 1 side of the cartridge loading member which made the recording head and the ink supply needle open for free passage protrude on the inner back To the lid attached in opening of the above-mentioned cartridge loading member in good rotation The feeder style of the ink cartridge characterized by preparing **** which supports pivotably the lifter member which is guided inside the above-mentioned proposal and displaces the free end, engages with the crevice established in the inferior surface of tongue of an ink cartridge at the free edge of this lifter member, and supports this ink cartridge.

[Claim 5] The feeder style of the ink cartridge according to claim 4 characterized by preparing the press section which turns to the above-mentioned ink supply needle the ink feed hopper prepared in the inferior surface of tongue of this ink cartridge in contact with the top face of the above-mentioned ink cartridge just before the closedown, and presses it to the inside of the above-mentioned lid possible [elastic deformation].

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink cartridge which has the description to the loading nature to the ink jet printer of a serial type, and its feeder style.

[0002]

[Description of the Prior Art] The loading nature to carriage is [how] scrupulous, and there is no ink cartridge used for the ink jet printer of a serial type, and it may make an ink feed hopper have to agree correctly in the ink supply needle which projects from the tooth back of a

recording head.
[0003] By carrying out rotation actuation of the lever, making the engagement projection projected to the medial surface engage with the engagement slot of an ink cartridge side face, this is turned to a recording head and the feeder style of the carriage which the basis of such a technical problem was shown at JP,7-32049,Y pushes it in.
[0004] However, at such feeder guard, on the relation which an engagement projection rotates to the circumference of the supporting point with a lever, as a result of the component of a force of a recording head and the right-angled sense acting on an ink cartridge by friction with an engagement projection, un-arranging of making this supply needle projected at the recording head tooth back according to this component of a force break arises.
[0005]
[Problem(s) to be Solved by the Invention] This invention was made in view of such a problem, and the place made into the purpose is to offer the new ink cartridge which can make the sense parallel to the axial center of an ink supply needle insert [ink cartridge] correctly on the occasion of ****, and its feeder style.
[0006]
[Means for Solving the Problem] namely, this invention as an ink cartridge for attaining such a technical problem The crevice combined with a part of lifter member is put side by side on the inferior surface of tongue of an ink cartridge body with an ink feed hopper. As a feeder style of this ink cartridge While establishing the interior of a proposal which extends in the sense parallel to the axial center of an ink supply needle in the inside 1 side of the cartridge loading member which made the recording head and the ink supply needle open for free passage protrude on the inner back The lifter member which is guided inside a proposal and displaces the free end to the lid attached in opening of a cartridge loading member in good rotation is supported pivotably. **** which engages with the crevice established in the inferior surface of tongue of an ink cartridge, and supports an ink cartridge is prepared in the free edge of this lifter member.
[0007]
[Embodiment of the Invention] Then, the example of this invention is explained below. Drawing 1 thru/or drawing 3 show one example of this invention about the feeder style which loads the carriage for color printers with an ink cartridge.
[0008] In drawing, a sign 1 is the carriage which served as the loading member of the ink cartridge shows around at a guide rod 2 and it runs to a scanning direction. This carriage 1 It is constituted so that it can load with two ink cartridges, the object for black ink, and the object for color ink. Where the ink supply needle 19 is made to project to the inner direction, the recording head 18 is attached in the inner inner side 3 of these cartridge loading sections, i.e., the insertion-and-detachment opening 4 of an ink cartridge 20 and the field of the opposite side, free [adjustment].
[0009] By ****** 6a which the guide slot 6 which shows this carriage 1 to the lower limit of the lifter 15 later mentioned on the side face of each insertion-and-detachment opening 4 is formed, and was formed in that upper limit While enabling it to hold a lid 10 to an open position through a lifter 15, it is constituted so that an ink cartridge 20 may be turned to a recording head 18 and you may make it go up and down perpendicularly by vertical section 6b of the sense parallel to the axial center of the ink supply needle 19 formed in half the bottom.
[0010] The lid 10 which rotates the supporting-point pin 11 as a core to the upper limit of the guide rod 2 approach of the insertion-and-detachment opening 4 is supported pivotably by this carriage 1, and by making the piece 12 of a pawl of the shape of a cross section of U characters

formed in this free edge in one engage and release the stop section 5 prepared in the side besides the carriage insertion-and-detachment opening 4, it is constituted so that a lid 10 may be opened and closed.
[0011] The piece 13 of cartridge press of the shape of a support-at-one-end stain formed by leaving one side by the side of the supporting-point pin 11 to this lid 10, and separating other three sides from a lid 10 to it is formed in one. By pressing against the top face of an ink cartridge 20 the free edge 13a projected downward where a lid 1 is stopped It is constituted so that it can keep putting the ink supply needle 19 by the side of a recording head 18 to the ink feed hopper 21 prepared in the inferior surface of tongue 22 of a cartridge 20.
[0012] Moreover, it is supported pivotably free [rotation of the end face of a lifter 15] by the part which approached free one end a little rather than the supporting-point pin 11 at this lid 10. moreover, the projected part 16 which protruded on the other end of this lifter 15 being constituted so that it may slide on the inside of the guide slot 6 mentioned above, and, where a lid 10 is opened wide until full Where it stopped the lid 10 in the location by ****** 6a of guide slot 6 upper limit and a lid 10 is rotated to the location in front of a closedown It is constituted by vertical section 6b of the sense parallel to the direction of an axial center of the ink supply needle 19 so that the ink cartridge 20 on a lifter 15 may be perpendicularly dropped to up to a recording head 18.
[0013] In addition, the signs 7 and 7 in drawing show the lever for include-angle adjustment which carries out rotation adjustment to the circumference of the supporting point which does not illustrate each recording head 18 of a color and black, and the sign 8 shows the lever for nozzle justification which justifies the recording head of a color in the direction of paper feed on the basis of the black recording head 18.
[0014] Drawing 4 thru/or drawing 6 are what showed the ink cartridge with which this carriage 1 is equipped. By the way, this ink cartridge 20 In order to compensate the reinforcement, while it is formed as a container of closing in of synthetic-resin material so that as many ink as possible can be held, and forming the opening edge 23 thickly While projecting to the up-and-down sense, forming a rib 25 in the corner of the lateral surface and planning the ** form of the depth direction, it is constituted so that friction in the case of wearing may be made small.
[0015] The ink feed hopper 21 is projected and formed in the longitudinal direction end of that inferior surface of tongue 22, and by thrusting the ink supply needle 6 into the film which is closing that end face, it is constituted by this ink cartridge 20 so that a free passage with the ink feed hopper 21 and a recording head 5 may be aimed at.
[0016] In the inferior surface of tongue 22 of this ink cartridge 20 Only by the crevice 24 which makes the groove of the die length which reaches a both-sides side into the part which ****(ed) to that ink feed hopper 21 side being formed, and dropping this ink cartridge 20 into the insertion-and-detachment opening 4 The secondary cross-section multiplier of an inferior surface of tongue 22 is made with size by forming this crevice 24 so that engagement to **** 16 of a rib 15 can be aimed at. When it is constituted so that the reinforcement of the cross direction of an ink cartridge 20 may be raised more, and also this ink cartridge 20 is vacuum-packed, as shown in drawing 6 by making the packing material 26 enter until elasticity limit full in a crevice 24 Even when air enters the interior, as the two-dot chain line showed, it should be constituted so that the buffer ability which can maintain internal negative pressure as much as possible according to the force of the packing material 26 which it is going to restore out of a crevice 24 may be given.
[0017] Moreover, by on the other hand, forming so that this crevice 24 may be made to project

inside an ink cartridge 20 It cooperates with the rib 28 of lid 27 inside which formed the ink feed hopper 21 side highly. The air bubbles of the porosity elastic material 29 enclosed with the interior are gradually made small to ink feed hopper 21 approach, the meniscus of this part is made greatly, when internal ink decreases in number, these is collected to the ink feed hopper 21 side, and it is constituted so that ink can all be used.

[0018] Thus, in the constituted example, in order to load carriage 1 with an ink cartridge 20 now, as shown in drawing 2 (a), a lid 10 is opened first, the projected part 16 of lifter 15 lower limit is stopped to ****** 6a of the guide slot 6, a lid 10 is held to an open position, the sense is set that the ink feed hopper 21 faces the ink supply needle 19 on it, and an ink cartridge 20 is dropped into the insertion-and-detachment opening 4 of carriage 1.

[0019] Thereby, as shown in drawing 2 (b), the ********** beam crevice 24 engages with the ink feed hopper 21 side at **** 17 of a lifter 15, and in the ink feed hopper 21, an ink cartridge 20 turns the heavier one of the opposite side down, and is held with the posture which inclined in the counterclockwise rotation in drawing.

[0020] When a lid 10 is shut in this condition, as shown in drawing 2 (c), and an ink cartridge 20 It descends to the interior, being led to insertion-and-detachment opening inside 4a of stop section 5 approach. Subsequently If the projected part 16 of lifter 15 lower limit reaches vertical section 6a of half the bottom of the guide slot 6 and **** 17 comes to descend perpendicularly, an ink cartridge 20 will change the posture into the level sense gradually, using the inside 4a upper limit by the side of the stop section as the supporting point.

[0021] And finally, if the projected part 16 of lifter 15 lower limit approaches the lower limit of the guide slot 6, as shown in drawing 2 (d) A cartridge 20 is dropped the piece 13 of a spring of the shape of a cantilever prepared in the lid 10 pressing a top face from a top by the point 13a. Penetrating of this is carried out to the ink feed hopper 21, tearing a film with the ink supply needle 19 located in right under [the], and the free passage unification of a recording head 18 and the ink cartridge 20 is carried out.

[0022] On the other hand, when the ink in an ink cartridge 20 needs to be lost by long-term record writing and the new ink cartridge 20 needs to be exchanged, the piece 12 of a pawl is pushed and a lid 10 is removed from the stop section 5.

[0023] Thereby, since the lid 10 has bounded upwards by the spring nature which the piece 13 of a spring has, if this is opened further, the projected part 16 guided at vertical section 6b of the guide slot 6 pushes up an ink cartridge 20 right above with a posture as it is with a lifter 15, it will make it secede from the ink feed hopper 21 after this, without making the ink supply needle 19 break, and will make drawing of an ink cartridge 20 possible.

[0024] Therefore, after raising an ink cartridge 20 also as that of the insertion-and-detachment opening 4 through the reverse of the actuation mentioned above to (a) from (c) of drawing 2 , it inserts and takes out henceforth with a finger.

[0025] On the other hand, since an ink cartridge 20 is ******(ed) while the ink cartridge 20 has been in the condition that a crevice 24 does not engage with **** 17 of a lifter 10 as it was shown in drawing 3 sense [reverse], i.e., when dropped with the posture in which the ink feed hopper 21 and the ink supply needle 19 do not face each other, the ink feed hopper 21 will touch base 4b first.

[0026] However, a user makes this unusual loading condition immediately known in this condition, without being interfered at this top face, it becoming impossible for a lid 10 to stop above, and press of an ink cartridge 20 also serving as impossible at coincidence, and producing breakage of the ink supply needle 19 by impossible press fit, since the top face of an ink

cartridge 20 has still projected above the insertion-and-detachment opening 4.
[0027] By the way, although the example about the ink cartridge with which the carriage for color printers is loaded, and its feeder style explains this invention, to say nothing of this invention being applicable also to the printer for monochrome, the above can load the 1 side of the body of a printer, or both sides with an ink cartridge, and can install, and can apply this invention to the printer of a format.
[0028]
[Effect of the Invention] Since the crevice for positioning which engages with some lifters was established in the inferior surface of tongue of a cartridge body according to this invention as stated above A lifter is minded. It not only can load the position of a cartridge loading member with this ink cartridge body normally, but Even when the thickness of an ink cartridge body is thinly formed to a limit that capacity of ink should be made [many / as possible] A crosswise secondary cross-section multiplier can be enlarged by this crevice, and that part reinforcement can be raised. Further Even when the hole of this part of the porous matter is made small by the part projected to the inner direction, a meniscus is made with size and the remainder becomes small, the remaining ink is collected near the ink feed hopper, it can remain and this can be used that there is nothing.
[0029] Moreover, while, establishing the interior of a proposal which extends in the sense parallel to the ink supply needle of a recording head in the 1 side of a cartridge loading member on the other hand Since the lifter member which supports the part of the ink feed hopper approach of a cartridge is made to meet the interior of a proposal by the switching operation of a lid and was made to carry out a variation rate Equip immediately or it makes it possible to make it break away. only by making a lid open and close, the ink cartridge which carried out engagement support is met on a lifter member at an ink supply needle -- making -- ** -- When an ink cartridge is inserted in the reverse sense, engagement to a supporter can be made into impossible and a user can be made it not only can to suppress breakage of an ink supply needle beforehand, but to detect unusual insertion immediately by making switching operation of a lid into impossible.
[0030] furthermore, not the side face of an ink cartridge but the part of the ink feed hopper approach of a pars basilaris ossis occipitalis -- supporting -- insertion and balking -- ****** -- since it was made like, while making the overhang part from a cartridge side face with needlessness and enlarging the hold volume of the part ink, a carriage loading member, i.e., the cross direction dimension of carriage, can be made small, and the miniaturization of the printer itself can also be attained.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the ink cartridge which has the description to the loading nature to the ink jet printer of a serial type, and its feeder style.

PRIOR ART

[Description of the Prior Art] The loading nature to carriage is [how] scrupulous, and there is no ink cartridge used for the ink jet printer of a serial type, and it may make an ink feed hopper have to agree correctly in the ink supply needle which projects from the tooth back of a recording head.

[0003] By carrying out rotation actuation of the lever, making the engagement projection projected to the medial surface engage with the engagement slot of an ink cartridge side face, this is turned to a recording head and the feeder style of the carriage which the basis of such a technical problem was shown at JP,7-32049,Y pushes it in.

[0004] However, at such feeder guard, on the relation which an engagement projection rotates to the circumference of the supporting point with a lever, as a result of the component of a force of a recording head and the right-angled sense acting on an ink cartridge by friction with an engagement projection, un-arranging of making this supply needle projected at the recording head tooth back according to this component of a force break arises.

EFFECT OF THE INVENTION

[Effect of the Invention] As stated above, in this invention, the crevice for positioning which engages with some lifters was established in the inferior surface of tongue of a cartridge body. A lifter is minded. Therefore, it not only can load the position of a cartridge loading member with this ink cartridge body normally, but Even when the thickness of an ink cartridge body is thinly formed to a limit that capacity of ink should be made [many / as possible] A crosswise secondary cross-section multiplier can be enlarged by this crevice, and that part reinforcement can be raised. Further Even when the hole of this part of the porous matter is made small by the part projected to the inner direction, a meniscus is made with size and the remainder becomes small, the remaining ink is collected near the ink feed hopper, it can remain and this can be used that there is nothing.

[0029] Moreover, it is while, establishing the interior of a proposal which extends in the sense parallel to the ink supply needle of a recording head in the 1 side of a cartridge loading member on the other hand, Since the lifter member which supports the part of the ink feed hopper approach of a cartridge is made to meet the interior of a proposal by the switching operation of a lid and was made to carry out a variation rate Equip immediately or it makes it possible to make it break away. only by making a lid open and close, the ink cartridge which carried out engagement support is met on a lifter member at an ink supply needle -- making -- ** -- When an ink cartridge is inserted in the reverse sense, engagement to a supporter can be made into impossible and a user can be made it not only can to suppress breakage of an ink supply needle beforehand, but to detect unusual insertion immediately by making switching operation of a lid into impossible.

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cross direction dimension of carriage, can be made small, and the miniaturization of the printer itself can also be attained.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] This invention was made in view of such a problem, and the place made into the purpose is to offer the new ink cartridge which can make the sense parallel to the axial center of an ink supply needle insert [ink cartridge] correctly on the occasion of ****, and its feeder style.

MEANS

[Means for Solving the Problem] namely, this invention as an ink cartridge for attaining such a technical problem The crevice combined with a part of lifter member is put side by side on the inferior surface of tongue of an ink cartridge body with an ink feed hopper. As a feeder style of this ink cartridge While establishing the interior of a proposal which extends in the sense parallel to the axial center of an ink supply needle in the inside 1 side of the cartridge loading member which made the recording head and the ink supply needle open for free passage protrude on the inner back The lifter member which is guided inside a proposal and displaces the free end to the lid attached in opening of a cartridge loading member in good rotation is supported pivotably. **** which engages with the crevice established in the inferior surface of tongue of an ink cartridge, and supports an ink cartridge is prepared in the free edge of this lifter member.
[0007]
[Embodiment of the Invention] Then, the example of this invention is explained below. Drawing 1 thru/or drawing 3 show one example of this invention about the feeder style which loads the carriage for color printers with an ink cartridge.
[0008] In drawing, a sign 1 is the carriage which served as the loading member of the ink cartridge shows around at a guide rod 2 and it runs to a scanning direction. This carriage 1 It is constituted so that it can load with two ink cartridges, the object for black ink, and the object for color ink. Where the ink supply needle 19 is made to project to the inner direction, the recording head 18 is attached in the inner inner side 3 of these cartridge loading sections, i.e., the insertion-and-detachment opening 4 of an ink cartridge 20 and the field of the opposite side, free [adjustment].
[0009] By ****** 6a which the guide slot 6 which shows this carriage 1 to the lower limit of the lifter 15 later mentioned on the side face of each insertion-and-detachment opening 4 is formed, and was formed in that upper limit While enabling it to hold a lid 10 to an open position through a lifter 15, it is constituted so that an ink cartridge 20 may be turned to a recording head 18 and you may make it go up and down perpendicularly by vertical section 6b of the sense parallel to the axial center of the ink supply needle 19 formed in half the bottom.
[0010] The lid 10 which rotates the supporting-point pin 11 as a core to the upper limit of the guide rod 2 approach of the insertion-and-detachment opening 4 is supported pivotably by this carriage 1, and by making the piece 12 of a pawl of the shape of a cross section of U characters formed in this free edge in one engage and release the stop section 5 prepared in the side besides

the carriage insertion-and-detachment opening 4, it is constituted so that a lid 10 may be opened and closed.
[0011] The piece 13 of cartridge press of the shape of a support-at-one-end stain formed by leaving one side by the side of the supporting-point pin 11 to this lid 10, and separating other three sides from a lid 10 to it is formed in one. By pressing against the top face of an ink cartridge 20 the free edge 13a projected downward where a lid 1 is stopped It is constituted so that it can keep putting the ink supply needle 19 by the side of a recording head 18 to the ink feed hopper 21 prepared in the inferior surface of tongue 22 of a cartridge 20.
[0012] Moreover, it is supported pivotably free [rotation of the end face of a lifter 15] by the part which approached free one end a little rather than the supporting-point pin 11 at this lid 10. moreover, the projected part 16 which protruded on the other end of this lifter 15 being constituted so that it may slide on the inside of the guide slot 6 mentioned above, and, where a lid 10 is opened wide until full Where it stopped the lid 10 in the location by ****** 6a of guide slot 6 upper limit and a lid 10 is rotated to the location in front of a closedown It is constituted by vertical section 6b of the sense parallel to the direction of an axial center of the ink supply needle 19 so that the ink cartridge 20 on a lifter 15 may be perpendicularly dropped to up to a recording head 18.
[0013] In addition, the signs 7 and 7 in drawing show the lever for include-angle adjustment which carries out rotation adjustment to the circumference of the supporting point which does not illustrate each recording head 18 of a color and black, and the sign 8 shows the lever for nozzle justification which justifies the recording head of a color in the direction of paper feed on the basis of the black recording head 18.
[0014] Drawing 4 thru/or drawing 6 are what showed the ink cartridge with which this carriage 1 is equipped. By the way, this ink cartridge 20 In order to compensate the reinforcement, while it is formed as a container of closing in of synthetic-resin material so that as many ink as possible can be held, and forming the opening edge 23 thickly While projecting to the up-and-down sense, forming a rib 25 in the corner of the lateral surface and planning the ** form of the depth direction, it is constituted so that friction in the case of wearing may be made small.
[0015] The ink feed hopper 21 is projected and formed in the longitudinal direction end of that inferior surface of tongue 22, and by thrusting the ink supply needle 6 into the film which is closing that end face, it is constituted by this ink cartridge 20 so that a free passage with the ink feed hopper 21 and a recording head 5 may be aimed at.
[0016] In the inferior surface of tongue 22 of this ink cartridge 20 Only by the crevice 24 which makes the groove of the die length which reaches a both-sides side into the part which ****(ed) to that ink feed hopper 21 side being formed, and dropping this ink cartridge 20 into the insertion-and-detachment opening 4 The secondary cross-section multiplier of an inferior surface of tongue 22 is made with size by forming this crevice 24 so that engagement to **** 16 of a rib 15 can be aimed at. When it is constituted so that the reinforcement of the cross direction of an ink cartridge 20 may be raised more, and also this ink cartridge 20 is vacuum-packed, as shown in drawing 6 by making the packing material 26 enter until elasticity limit full in a crevice 24 Even when air enters the interior, as the two-dot chain line showed, it should be constituted so that the buffer ability which can maintain internal negative pressure as much as possible according to the force of the packing material 26 which it is going to restore out of a crevice 24 may be given.
[0017] Moreover, by on the other hand, forming so that this crevice 24 may be made to project inside an ink cartridge 20 It cooperates with the rib 28 of lid 27 inside which formed the ink feed

hopper 21 side highly. The air bubbles of the porosity elastic material 29 enclosed with the interior are gradually made small to ink feed hopper 21 approach, the meniscus of this part is made greatly, when internal ink decreases in number, these is collected to the ink feed hopper 21 side, and it is constituted so that ink can all be used.

[0018] Thus, in the constituted example, in order to load carriage 1 with an ink cartridge 20 now, as shown in drawing 2 (a), a lid 10 is opened first, the projected part 16 of lifter 15 lower limit is stopped to ****** 6a of the guide slot 6, a lid 10 is held to an open position, the sense is set that the ink feed hopper 21 faces the ink supply needle 19 on it, and an ink cartridge 20 is dropped into the insertion-and-detachment opening 4 of carriage 1.

[0019] Thereby, as shown in drawing 2 (b), the ********** beam crevice 24 engages with the ink feed hopper 21 side at **** 17 of a lifter 15, and in the ink feed hopper 21, an ink cartridge 20 turns the heavier one of the opposite side down, and is held with the posture which inclined in the counterclockwise rotation in drawing.

[0020] When a lid 10 is shut in this condition, as shown in drawing 2 (c), and an ink cartridge 20 It descends to the interior, being led to insertion-and-detachment opening inside 4a of stop section 5 approach. Subsequently If the projected part 16 of lifter 15 lower limit reaches vertical section 6a of half the bottom of the guide slot 6 and **** 17 comes to descend perpendicularly, an ink cartridge 20 will change the posture into the level sense gradually, using the inside 4a upper limit by the side of the stop section as the supporting point.

[0021] And finally, if the projected part 16 of lifter 15 lower limit approaches the lower limit of the guide slot 6, as shown in drawing 2 (d) A cartridge 20 is dropped the piece 13 of a spring of the shape of a cantilever prepared in the lid 10 pressing a top face from a top by the point 13a. Penetrating of this is carried out to the ink feed hopper 21, tearing a film with the ink supply needle 19 located in right under [the], and the free passage unification of a recording head 18 and the ink cartridge 20 is carried out.

[0022] On the other hand, when the ink in an ink cartridge 20 needs to be lost by long-term record writing and the new ink cartridge 20 needs to be exchanged, the piece 12 of a pawl is pushed and a lid 10 is removed from the stop section 5.

[0023] Thereby, since the lid 10 has bounded upwards by the spring nature which the piece 13 of a spring has, if this is opened further, the projected part 16 guided at vertical section 6b of the guide slot 6 pushes up an ink cartridge 20 right above with a posture as it is with a lifter 15, it will make it secede from the ink feed hopper 21 after this, without making the ink supply needle 19 break, and will make drawing of an ink cartridge 20 possible.

[0024] Therefore, after raising an ink cartridge 20 also as that of the insertion-and-detachment opening 4 through the reverse of the actuation mentioned above to (a) from (c) of drawing 2 , it inserts and takes out henceforth with a finger.

[0025] On the other hand, since an ink cartridge 20 is ******(ed) while the ink cartridge 20 has been in the condition that a crevice 24 does not engage with **** 17 of a lifter 10 as it was shown in drawing 3 sense [reverse], i.e., when dropped with the posture in which the ink feed hopper 21 and the ink supply needle 19 do not face each other, the ink feed hopper 21 will touch base 4b first.

[0026] However, a user makes this unusual loading condition immediately known in this condition, without being interfered at this top face, it becoming impossible for a lid 10 to stop above, and press of an ink cartridge 20 also serving as impossible at coincidence, and producing breakage of the ink supply needle 19 by impossible press fit, since the top face of an ink cartridge 20 has still projected above the insertion-and-detachment opening 4.

[0027] By the way, although the example about the ink cartridge with which the carriage for color printers is loaded, and its feeder style explains this invention, to say nothing of this invention being applicable also to the printer for monochrome, the above can load the 1 side of the body of a printer, or both sides with an ink cartridge, and can install, and can apply this invention to the printer of a format.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the perspective view of the carriage equipped with the cartridge feeder style which makes one example of this invention.
[Drawing 2] (a) Or (d) is the explanatory view having shown loading actuation of an ink cartridge in order.
[Drawing 3] It is drawing having shown the condition of having loaded the reverse sense.
[Drawing 4] It is the perspective view having shown one example of the ink cartridge with which it is loaded by this feeder style.
[Drawing 5] It is drawing having shown the cross section of a cartridge same as the above.
[Drawing 6] It is drawing having shown a part of cartridge same as the above in the condition of having packed.
[Description of Notations]
1 Carriage
4 Loading Opening
6 Guide Slot
10 Lid
13 Piece of Spring
15 Lifter
17 ****
18 Recording Head
19 Ink Supply Needle
20 Ink Cartridge
21 Ink Feed Hopper
24 Crevice

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(71)出願人　000002369
セイコーエプソン株式会社
東京都新宿区西新宿２丁目４番１号

(72)発明者　五十嵐　人志
長野県諏訪市大和３丁目３番５号　セイコーエプソン株式会社内

(72)発明者　吉田　昌敬
長野県諏訪市大和３丁目３番５号　セイコーエプソン株式会社内

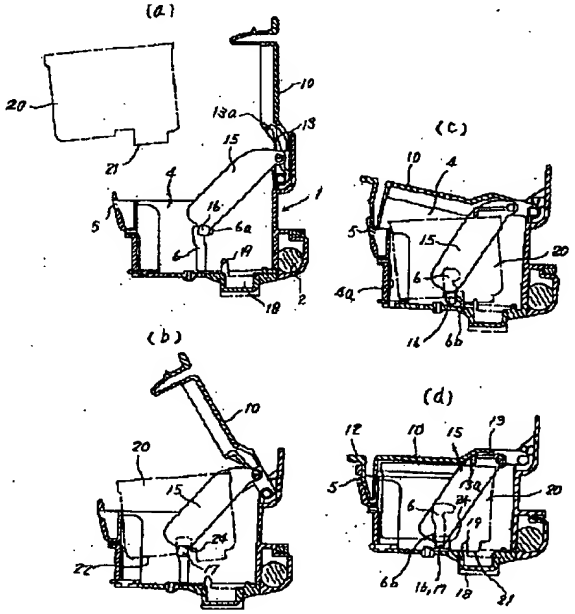
(74)代理人　弁理士　西川　慶治　（外１名）

(54)【発明の名称】　インクカートリッジとその装填機構

(57)【要約】　（修正有）

【課題】　カートリッジ装填部材に正しく装脱することのできるインクカートリッジ２０と、その装填機構を供給すること。

【解決手段】　インクカートリッジ２０の下面に設けた凹部２４に支杆１７を係合させた上、インク供給針１９の軸心と平行な向きのガイド溝６によってリフタ１５を案内しつつ蓋体１０を閉止してゆくことにより、インクカートリッジ２０を記録ヘッド１８に向けて正しく降下させて、インク供給針１９を損傷させることなくこれを正しく装着させるようにしたもの。



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【特許請求の範囲】

【請求項１】　インクカートリッジ本体の下面に、リフタ部材の一部と結合する凹部をインク供給口とともに併設したことを特徴とするインクカートリッジ。

【請求項２】　上記凹部を、上記インクカートリッジ本体の両側面に達する長さに形成したことを特徴とする請求項１記載のインクカートリッジ。

【請求項３】　上記凹部を、インクカートリッジ本体の内側に突出するように形成したことを特徴とする請求項１記載のインクカートリッジ。

【請求項４】　内奥に記録ヘッドと連通するインク供給針を突設させたカートリッジ装填部材の内面一側に、上記インク供給針の軸心と平行な向きに延びる案内部を設けるとともに、上記カートリッジ装填部材の開口部に可回動的に取り付けた蓋体に、自由端を上記案内部に案内されて変位するリフタ部材を枢支し、該リフタ部材の自由端部に、インクカートリッジの下面に設けた凹部と係合して該インクカートリッジを支持する支杆を設けたことを特徴とするインクカートリッジの装填機構。

【請求項５】　上記蓋体の内面に、閉止直前において上記インクカートリッジの頂面と当接して該インクカートリッジの下面に設けたインク供給口を上記インク供給針に向けて押圧する押圧部を弾性変形可能に設けたことを特徴とする請求項４記載のインクカートリッジの装填機構。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、シリアルタイプのインクジェットプリンタへの装填性に特徴を有するインクカートリッジとその装填機構に関する。

【０００２】

【従来の技術】シリアルタイプのインクジェットプリンタに使用するインクカートリッジは、キャリッジへの装填性の如何に拘りなく、記録ヘッドの背面から突出するインク供給針にインク供給口を正しく合致させ得るものでなければならない。

【０００３】このような課題のもとに実公平７－３２０４９号公報に提示されたキャリッジの装填機構は、レバーを回動操作することによって、その内側面に突出した係合突起をインクカートリッジ側面の係合溝に係合させつつこれを記録ヘッドに向けて押込むようにしたものである。

【０００４】ところが、このような装填機構では、係合突起がレバーとともに支点回りに回動する関係上、係合突起との摩擦によりインクカートリッジに記録ヘッドと直角な向きの分力が作用する結果、この分力により記録ヘッド背面に突出したこの供給針を折損させかねないといった不都合が生じる。

【０００５】

【発明が解決しようとする課題】本発明はこのような問題に鑑みてなされたもので、その目的とするところは、装脱に際してインクカートリッジをインク供給針の軸心と平行な向きに正しく挿脱させることのできる新たなインクカートリッジとその装填機構を提供することにある。

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【０００６】

【課題を解決するための手段】すなわち、本発明はこのような課題を達成するためのインクカートリッジとして、インクカートリッジ本体の下面に、リフタ部材の一部と結合する凹部をインク供給口とともに併設するようにしたものであり、また、このインクカートリッジの装填機構として、内奥に記録ヘッドと連通するインク供給針を突設させたカートリッジ装填部材の内面一側に、インク供給針の軸心と平行な向きに延びる案内部を設けるとともに、カートリッジ装填部材の開口部に可回動的に取り付けた蓋体に、自由端を案内部に案内されて変位するリフタ部材を枢支し、このリフタ部材の自由端部に、インクカートリッジの下面に設けた凹部と係合してインクカートリッジを支持する支杆を設けるようにしたものである。

【０００７】

【発明の実施の形態】そこで以下に本発明の実施例について説明する。図１乃至図３は、カラープリンタ用のキャリッジにインクカートリッジを装填するその装填機構についての本発明の一実施例を示したものである。

【０００８】図において符号１は、ガイドロッド２に案内されて走査方向に走行するインクカートリッジの装填部材を兼ねたキャリッジで、このキャリッジ１は、黒インク用とカラーインク用の２つのインクカートリッジを装填し得るように構成されていて、これらのカートリッジ装填部の内奥面３、つまりインクカートリッジ２０の挿脱口４と反対側の面には、インク供給針１９を内方に突出させた状態で記録ヘッド１８が調整自在に取付けられている。

【０００９】このキャリッジ１には、各挿脱口４の側面に後述するリフタ１５の下端を案内するガイド溝６が設けられていて、その上端に形成した鍵型部６ａにより、リフタ１５を介して蓋体１０を開放位置に保持できるようにするとともに、下半に形成したインク供給針１９の軸心と平行な向きの垂直部６ｂにより、インクカートリッジ２０を記録ヘッド１８に向けて垂直に昇降させ得るように構成されている。

【００１０】このキャリッジ１には、挿脱口４のガイドロッド２寄りの上端に、支点ピン１１を中心として回動する蓋体１０が枢支されていて、この自由端部に一体的に形成した断面Ｕ字状の爪片１２をキャリッジ挿脱口４の他側に設けた係止部５に係脱させることによって蓋体１０を開閉するように構成されている。

【００１１】この蓋体１０には、支点ピン１１側の一辺を残して他の３辺を蓋体１０から切り離すことにより形

成した片持染状のカートリッジ押圧片１３が一体的に設けられていて、蓋体１を閉止した状態で下向きに突出したその自由端部１３ａをインクカートリッジ２０の頂面に押し当てることによって、カートリッジ２０の下面２２に設けたインク供給口２１に記録ヘッド１８側のインク供給針１９を差し通すことができるように構成されている。

【００１２】またこの蓋体１０には、支点ピン１１よりも若干自由端側に寄った部分にリフタ１５の基端が回動自在に枢支され、また、このリフタ１５の他端に突設した突部１６は上述したガイド溝６内を摺動するように構成されていて、蓋体１０を一杯まで開放した状態では、ガイド溝６上端の鍵型部６ａによって蓋体１０をその位置に係止し、また、蓋体１０を閉止直前の位置まで回動させた状態では、インク供給針１９の軸心方向と平行な向きの垂直部６ｂにより、リフタ１５上のインクカートリッジ２０を記録ヘッド１８の上へ垂直に降下させ得るように構成されている。

【００１３】なお、図中符号７、７はカラー及び黒の各記録ヘッド１８を図示しない支点回りに回動調整する角度調整用のレバーを示しており、また符号８は、黒の記録ヘッド１８を基準としてカラーの記録ヘッドを紙送り方向に位置調整するノズル位置調整用のレバーを示している。

【００１４】ところで、図４乃至図６はこのキャリッジ１に装着するインクカートリッジを示したもので、このインクカートリッジ２０は、インクを可能な限り多く収容することができるよう合成樹脂材により肉薄の容器として形成され、その強度を補うために開口縁２３を肉厚に形成するとともに、外側面の角部にはリブ２５を上下の向きに突出形成して深さ方向の保形を図るとともに、装着の際の摩擦を小さくするように構成されている。

【００１５】このインクカートリッジ２０には、その下面２２の長手方向一端にインク供給口２１が突出形成され、その端面を封止しているフィルムにインク供給針６を突き通すことによって、インク供給口２１と記録ヘッド５との連通を図るように構成されている。

【００１６】このインクカートリッジ２０の下面２２には、そのインク供給口２１側に偏寄した部分に、両側面に達する長さの溝状をなす凹部２４が形成されていて、このインクカートリッジ２０を挿脱口４に落し込むだけで、リブ１５の支杆１６との係合が図れるように、かつ、この凹部２４を設けることにより下面２２の断面２次係数を大となして、インクカートリッジ２０の巾方向の強度をより高めるように構成され、またさらに、このインクカートリッジ２０を真空包装した際に、図６に示したように、その包装材２６を凹部２４内に弾性限界一杯まで入り込ませておくことにより、万一、内部に空気が入り込んだ場合でも、２点鎖線で示したように、凹部２４内から復元しようとする包装材２６の力により内部の負圧を可能な限り保つことができるようなバッファ機能を持たせるように構成されている。

【００１７】また一方、この凹部２４をインクカートリッジ２０の内部に突出させるように形成することにより、インク供給口２１側を高く形成した蓋２７内面のリブ２８と協同して、内部に封入した多孔質弾性材２９の気泡をインク供給口２１寄りへと徐々に小さくし、この部分のメニスカスを大きくなして、内部のインクが減少した際にこれをインク供給口２１側へ集めて、インクを残らず使用することができるように構成されている。

【００１８】このように構成された実施例において、いま、インクカートリッジ２０をキャリッジ１に装填するには、図２（ａ）に示したように、はじめに蓋体１０を開いてリフタ１５下端の突部１６をガイド溝６の鍵型部６ａに係止して蓋体１０を全開位置に保持し、その上で、インク供給口２１がインク供給針１９と向い合うように向きを定めてインクカートリッジ２０をキャリッジ１の挿脱口４に落とし込む。

【００１９】これにより、インクカートリッジ２０は、図２（ｂ）に示したように、インク供給口２１側に偏寄らせて設けた凹部２４がリフタ１５の支杆１７に係合し、インク供給口２１とは反対側の重い方を下にして、図中反時計方向に傾斜した姿勢のまま保持される。

【００２０】そして、この状態で蓋体１０を閉めてゆくと、図２（ｃ）に示したように、インクカートリッジ２０は、係止部５寄りの挿脱口内面４ａに導かれながら内部に下降してゆき、ついで、リフタ１５下端の突部１６がガイド溝６下半の垂直部６ａに達して支杆１７が垂直に下降してゆくようになると、インクカートリッジ２０は係止部側の内面４ａ上端を支点としつつその姿勢を徐々に水平な向きに変えてゆく。

【００２１】そして最後に、リフタ１５下端の突部１６がガイド溝６の下端に近づくと、図２（ｄ）に示したように、蓋体１０に設けた片持梁状のバネ片１３がその先端部１３ａで頂面を上から押圧しつつカートリッジ２０を下降させ、その真下に位置するインク供給針１９によってフィルムを破りつつこれをインク供給口２１に貫入させて、記録ヘッド１８とインクカートリッジ２０とを連通一体化させる。

【００２２】一方、長期の記録書込みによりインクカートリッジ２０内のインクがなくなって新たなインクカートリッジ２０を交換する必要が生じた場合には、爪片１２を押して蓋体１０を係止部５から外す。

【００２３】これにより、蓋体１０はバネ片１３の持つバネ性により上方へ跳ね上げられるから、これをさらに開いてゆくと、ガイド溝６の垂直部６ｂに案内された突部１６は、リフタ１５とともにインクカートリッジ２０をそのままの姿勢で真上に押上げ、インク供給針１９を折損させることなくインク供給口２１をこれから離脱させて、インクカートリッジ２０の取出しを可能にする。

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【００２４】したがって、以後は、図２の（ｃ）から（ａ）へと上述した動作の逆を経てインクカートリッジ２０を挿脱口４のもと上昇させた上、指で挟んで取出す。

【００２５】これに対して、インクカートリッジ２０が逆向きに、つまりインク供給口２１とインク供給針１９が向き合わないような姿勢で落とし込まれた場合には、図３に示したように、凹部２４がリフタ１０の支杆１７と係合しない状態のままインクカートリッジ２０が引降ろされるため、はじめにインク供給口２１が底面４ｂに接することになる。

【００２６】ところが、この状態ではインクカートリッジ２０の頂面が未だ挿脱口４の上方に突出しているため、蓋体１０がこの頂面に邪魔されてこれ以上閉止することができなくなり、同時にインクカートリッジ２０の押圧も不能となって、無理な圧入によるインク供給針１９の折損を生じさせることなく、この異常な装填状態を直ちに使用者に判らせる。

【００２７】ところで、以上は、カラープリンタ用のキャリッジに装填するインクカートリッジとその装填機構についての例によって本発明を説明したものであるが、モノクロ用のプリンタにも本発明を適用することができることは言うまでもなく、また、インクカートリッジをプリンタ本体の一側もしくは両側に装填する据え付け形式のプリンタにも本発明を適用することができる。

【００２８】

【発明の効果】以上述べたように本発明によれば、カートリッジ本体の下面にリフタの一部と係合する位置決め用の凹部を設けたので、リフタを介してこのインクカートリッジ本体をカートリッジ装填部材の所定の位置に正常に装填することができるばかりでなく、インクの収容量を可能な限り多くすべくインクカートリッジ本体の肉厚を限度まで薄く形成した場合でも、この凹部により幅方向の断面２次係数を大きくしてその分強度を高めることができ、さらには、内方に突出した部分により多孔性物質のこの部分の孔を小さくし、メニスカスを大となして、残りが僅かとなった場合でも残りのインクをインク供給口の近くに集めてこれを残りなく使用することができる。

【００２９】また一方、カートリッジ装填部材の一側に、記録ヘッドのインク供給針と平行な向きに延びる案内部を設けるとともに、カートリッジのインク供給口寄りの部分を支持するリフタ部材を、蓋体の開閉操作により案内部に沿わせて変位させるようにしたので、蓋体を単に開閉させるだけで、リフタ部材上に係合支持したインクカートリッジをインク供給針に沿わせて真すぐに装着し、あるいは離脱させることを可能として、インク供給針の破損を未然に抑えることができるばかりでなく、インクカートリッジを逆向きに挿入した場合には、支持部との係合を不能とし蓋体の開閉操作を不能として、異常な挿入を使用者に直ちに検知させることができる。

【００３０】またさらに、インクカートリッジの側面ではなく、底部のインク供給口寄りの部分を支持して挿入と離脱を行わすようにしたので、カートリッジ側面からの張出し部分を不要となしてその分インクの収容容積を大きくするとともに、キャリッジ装填部材、つまりキャリッジの巾方向寸法を小さくして、プリンタ自体の小型化をも図ってゆくことができる。

【図面の簡単な説明】

【図１】本発明の一実施例をなすカートリッジ装填機構を備えたキャリッジの斜視図である。

【図２】（ａ）乃至（ｄ）はインクカートリッジの装填動作を順に示した説明図である。

【図３】逆向きに装填した状態を示した図である。

【図４】この装填機構により装填されるインクカートリッジの一実施例を示した斜視図である。

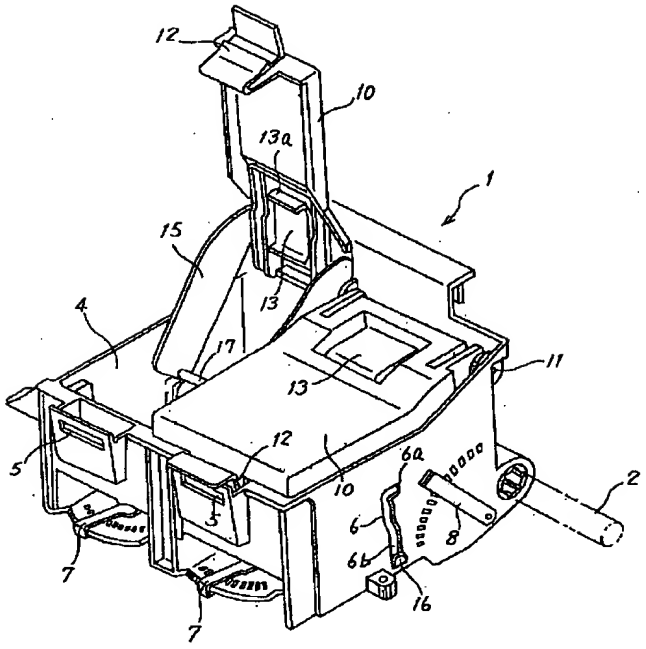
【図５】同上カートリッジの断面を示した図である。

【図６】パックした状態での同上カートリッジの一部を示した図である。

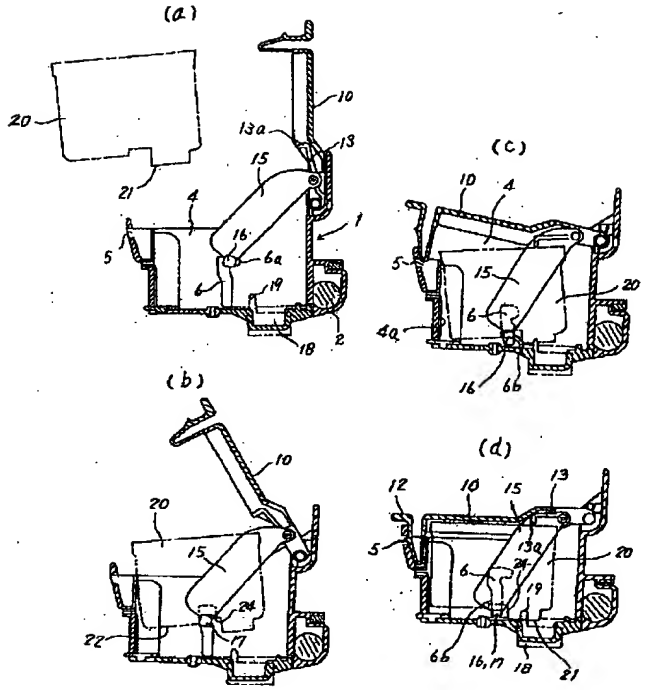
【符号の説明】

１　キャリッジ
４　装填口
６　ガイド溝
１０　蓋体
１３　バネ片
１５　リフタ
１７　支杆
１８　記録ヘッド
１９　インク供給針
２０　インクカートリッジ
２１　インク供給口
２４　凹部

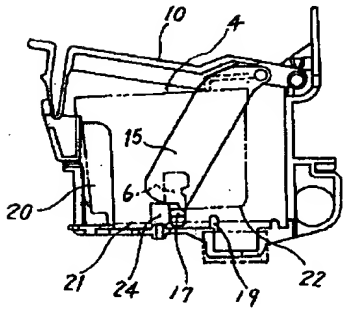
【図１】


12
10
13a
1
15
13
4
17
11
5
12
10
6a
2
6
8
6b
16
7
7

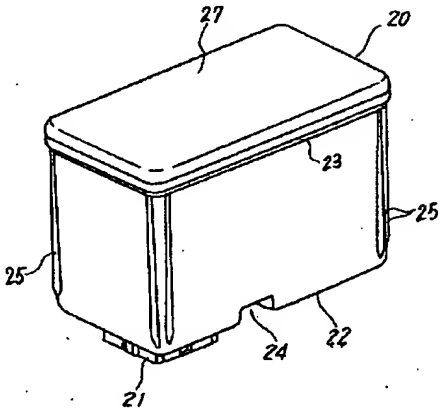
【図２】


(a)
20
10
13a
13
15
21
4
1
5
16
6a
19
18
2
(c)
10
4
5
15
20
6
4a
16
6b
(b)
10
20
15
24
22
17
(d)
12
10
15
13
5
13a
20
6
24
19
6b
16,17
18
21

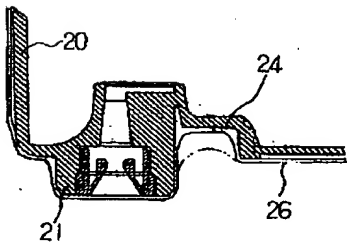
【図３】


10
4
15
6
20
21
24
17
19
22

【図４】


27
20
23
25
25
24
22
21

【図６】


20
24
21
26

【図５】